REMARKS

Applicants have amended the claims to more particularly define the invention taking into consideration the outstanding Official Action. Claim 1 has been further amended to specify that the grain size is in the nano-scale as fully supported by the specification at page 8, line 2. Claim 12 has been added to more particularly define nano-scale as would be understood by one of ordinary skill in the art to which the invention pertains. See the internet and the attached copy of the definition of nano-scale.

In response to the Examiner's comments with respect to the failure of the claims to recite argued limitations. This point has been obviated by the amendment to the claims as fully supported by the specification as it would be interpreted by one of ordinary skill in the art to which the invention pertains. Since this amendment creates a new issue, an RCE has been filed to insure entry of the amendment.

The rejection of claims 1-3, and 5-11 under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Yamada et al. has been carefully considered but is most respectfully traversed.

In the Official Action it is urged that Wu et al. describes an electrochemical synthesis of barium titanate thin films that are grown by electrochemical oxidation of a titanium surface in an electrolyte containing barium ions. However, it is recognized that Wu et al. do not teach the claimed process step of coating a heterogeneous substrate such as silicon with a titanium film prior to performing the oxidation.

It is further stated that Yamada et al. teach that it is known to coat a silicon substrate with a titanium film by sputtering in order to create a titanium surface on the substrate.

It is concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the electrochemical method of WU et al. on the titanium-coated substrate of Yamada et al. with expected success.

Applicants again wish to direct the Examiner's attention to the basic requirements of a prima facie case of obviousness as set forth in the MPEP § 2143. This section states that to establish a prima facie case of obviousness, three basic criteria first must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Section 2143.03 states that all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Applicants also most respectfully direct the Examiner's attention to MPEP § 2144.08 (page 2100-114) wherein it is stated that Office personnel should consider all rebuttal argument and evidence present by applicant and the citation of In re Soni for error in not considering evidence presented in the specification.

The cited '411 reference teaches one kind of common prior art that a titanium film is deposited on a silicon substrate for a middle layer between the silicon substrate and

TiN (titanium nitride) to enable the TiN to be fixed or deposited onto the silicon substrate as a barrier layer.

In the present invention, the heterogeneous substrate, like silicon, is deposited with a titanium film thereon for the purpose of acceleration of the rate that $BaTiO_3$ is formed. As recited in lines 2-14, page 7 and lines 5-9, page 8 of the present specification, the particles of the titanium film are very fine as specified in the claims to enable $BaTiO_3$ to be rapidly formed under room temperature. The grain size is a claim limitation which cannot be ignored.

The cited '411 patent does not disclose/anticipate such feature/effect of the present invention, such that claim 1 of the present invention should comply with 35 U.S.C. 103. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Yamada et al. as applied to claim 1 above, and further in view of Mattox has been carefully considered but is most respectfully traversed.

The Examiner states that Wu et al. and Yamada et al. teach the features as previously described. However, these references do not teach depositing a titanium film on a substrate using evaporation. Mattox teaches that sputtering and evaporation are both common methods for depositing a metallic film on a substrate.

It is then concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the titanium film to the silicon substrate by evaporation in order to provide titanium surface to be reacted with the barium ions, since Mattox teaches that this method would be functionally equivalent to the sputtering technique taught by Yamada et al.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all of the claims now present in the application are most respectfully requested.

Respectfully submitted,

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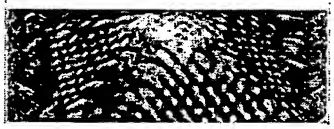

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Nanotechnology definition (NSET, February 2000)

Research and technology development at the atomic, molecular or macromolecular levels, in the length scale of approximately 1 - 100 nanometer range; to provide a fundamental understanding of phenomena and materials at the nanoscale and to create and use structures, devices and systems that have novel properties and functions because of their small and/or intermediate size. The novel and differentiating properties and functions are developed at a critical length scale of matter typically under 100 nm. Nanotechnology research and development includes manipulation under control of the nanoscale structures and their integration into larger material components, systems and architectures. Within these larger scale assemblies, the control and construction of their structures and components remains at the nanometer scale. In some particular cases, the critical length scale for novel properties and phenomena may be under 1 nm (e.g., manipulation of atoms at ~0.1 nm) or be larger than 100 nm (e.g., nanoparticle reinforced polymers have the unique feature at ~ 200-300 nm as a function of the local bridges or bonds between the nano particles and the polymer).

References (all on this website http://www.nano.gov):

- Nanotechnology Research Directions, 1999
- National Nanotechnology Initiative and Its Implementation Plan, 2000
- Societal Implications of Nanoscience and Nanotechnology, 2001

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Top